

Remarks

This communication is considered fully responsive to the Office Action mailed September 19, 2007 and made Final ("Office Action"). Claims 1-30 were examined. Claims 1-30 stand rejected. Claims 1, 13, 26, and 30 are amended. No claims are canceled. No new claims have been added. Reexamination and reconsideration of the currently pending claims are respectfully requested.

Claim Objections

The Office Action objected to claims 26 and 30 as including typographical errors. The amendments to claims 26 and 30 are believed to address the objection. Applicant appreciates the Examiner noting these typographical errors.

Claim Rejections - 35 U.S.C. 112

The Office Action rejected claims 26 and 30 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In particular, the Office Action states that there is no support for the term "compositional overshoot." Applicant respectfully traverses this rejection.

The subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement. MPEP 2163.02. Instead, the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession

of the invention as now claimed. MPEP 2163.02 citing *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). An applicant may rely on, among other things, words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. MPEP 2163.02 citing *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997).

Support for the recitations "compositional overshoot" is clearly found at least in the drawings as originally filed. Figure 5 is a graph of idealized misfit profiles for an optimized DH showing the bulk, unstrained misfit for the fully relaxed layers, and the strained, in-plane misfit as functions of position with respect to the substrate surface using the optimized heterostructure design. See, e.g., description of Figure 5 on page 5 of the specification. Specifically, the bulk misfit difference Δf shown in Figure 5 represents the compositional overshoot. The difference in bulk misfit Δf is clearly illustrated between the transition step graded region (e.g., at $n=9$) and the intermediate region.

Applicant also directs the Examiner's attention to Figure 6. Figure 6 is a schematic diagram illustrating a strained buffer layer providing a lattice-matched template for the coherent growth of an unstrained active layer. An intermediate region is inserted between the step-graded and active regions for structural isolation. The thin, cross-hatched lines represent crystallographic planes. The partially coherent interface structure below the buffer layer has been simplified for clarity. Relevant parameteric relationships corresponding to various layers and interfaces are listed to the right of the diagram. See, e.g., description of Figure 6 on page 5 of the specification. Specifically, the

compositional overshoot of the buffer layer (step n) is illustrated by the grids representing atomic planes in the buffer region. The grids in the buffer region are “stretched” relative to the grids shown in the underlying graded region (step n-1) and match the grids in the intermediate and active regions.

Withdrawal of the rejection of claims 26 and 30 is respectfully requested for at least these reasons.

The Office Action also rejected claims 1-30 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In particular, the Office Action states that “[t]here is no support for ‘relaxed’ in claims 1 and 13, and that claims 2-12 and 14-30 depend from claims 1 and 13, respectively. Applicant respectfully traverses this rejection.

The description of the drawings states that Figure 5 is a graph of idealized misfit profiles for an optimized DH showing the bulk, unstrained misfit (shown in Figure 5 by the solid line) for the fully relaxed layers, and the strained, in-plane misfit (shown in Figure 5 by the dashed line) as functions of position with respect to the substrate surface using the optimized heterostructure design.

Claim Rejections - 35 U.S.C. 103(a)

The Office Action rejected claims 1-25 and 27-29 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,518,934 to Forrest, et al. (“Forrest”) in view of U.S. Patent No. 6,229,152 to Dries, et al. (“Dries”). The Office Action also rejected claims 26 and 30 under 35 U.S.C. 103(a) as being

unpatentable over Forrest in view of Dries and further in view of U.S. Patent No. 6,350,993 to Chu, et al. ("Chu").

Claims 1 and 13 are amended to include numerous recitations not disclosed or taught by the prior art of record. Applicant believes that Forrest fails to disclose the claim recitations for the reasons noted in the previous Response. Dries and Chu also fail to disclose all of the recitations in the currently amended claims.

The remaining claims depend from claim 1 or claim 13 and therefore are believed to be allowable for at least the same reasons. Therefore, Applicant believes the rejections are moot.

It is noted that Applicant makes no admission that the rejections are supported by the cited references. Applicant reserves the right to present further substantive arguments if these or other rejections based on the cited references are presented in a subsequent office action.

Reexamination and reconsideration of the currently pending claims are respectfully requested.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this matter.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Mark D. Trenner", written over a horizontal line.

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